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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/062,995 | 01/31/2002 | Steven Teig | SPLX.P0105 | 2855 |

23349 7590 06/05/2003

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| EXAMINER |
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ROSSOSHEK, YELENA

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| ART UNIT | PAPER NUMBER |
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2825

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/062,995

Applicant(s)

TEIG ET AL.

Examiner

Helen B Rossoshek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because: the source of the incoming arrow to the flowchart must be identified or deleted on the Figures 28B, 29B, 31B and 53B.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: the serial number of the US Provisional Patent entitled "Method and Apparatus for Routing a Set of Nets" needs to be inserted.

Appropriate correction is required.

Claim Objections

3. Claims 2-4, 6 and 9 are objected to because of the following informalities:

Claim 2 line 3 insert --the-- before "shape"

Claim 3 line 3 insert --the— before "shape"

Claim 4 line 3 insert --the— before "shape"

Claim 6 line 1 insert --a— before "different"

Claim 9 line 3 insert --the— before "shape"

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bui (US Patent 6,320,391) in view of Igarashi et al. (IS Patent 6,546,540).

As to claims 1-3 Bui teaches a first set of vias that have a diamond shape and a second of vias that have a rectangular shape within a test structure 200 of FIG. 2, which is used to simulate a high-density semiconductor integrated circuit fabricated with multiple levels of metal interconnections shown on the Fig. 3 (col. 5, ll.61-63; col. 8, ll.52-54); wherein the diamond shape is a square rotated by 45° shown on the Fig. 4 (vias 424)(col. 6, ll.21-22; col. 8, ll.55-57), the vias contacts might be in shape of circle also as shown on the Fig. 5 (524) and Fig. 6 (624), but lacks the combination of multiple layers of the integrated circuit and different shapes of contacts in the set of vias. However Igarashi et al. teaches a first via in the first set traverses two layers of the integrated circuit layout and the first via has a contact on each of the layers, wherein each contact is in shape of a diamond within connecting different layers with optimal shapes of via holes (col. 2, ll.55-58) as shown on the Fig. 3 and Fig. 4A creating a diamond shape (col. 8, ll.54-60; Fig. 14B) and wherein metal connections 13 and 11 are in the different layers (Fig. 4C); a second via in the second set traverses two layers of the integrated circuit layout and the second via has a contact on each of the layers,

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wherein each contact of the second via is in a shape of a rectangular (col. 9, ll.3-15). It would have been obvious to one of ordinary skill on the art at the time the invention was made to have used Igarashi et al. to teach specifics subject matter Bui does not teach, because it enables a CAD to process a terminal layout of connection between a few layers of the integrated circuit with different preferable direction of connections at a high efficiency.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 4-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Igarashi et al. (US Patent 6,546,540).

As to claims 4-8 Igarashi et al. teaches each via in the first set traverses at least two layers and has one contact on each of the layers, wherein one of the contacts is in shape of a rectangular and one of the contacts is in shape of diamond (square rotated by 45° or parallelogram) (col. 22, ll.57-60); the integrated circuit layout, wherein the rectangle is square (col. 9, ll.5-7; col. 22, ll.57-60); the rectangle has different length and width as well known from the geometry and shown on the fig. 10B (col. 9, ll.7-8); the diamond has four equal sides as shown on the Fig. 13B; and wherein the diamond has

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two pairs of sides, wherein the length of one pair of sides is different than length of the other pair of sides, known by geometrical definition as parallelogram (col. 8, ll.59-60).

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Rostoker et al (US Patent 5,822,214).

As to claim 9 Rostoker et al. teaches each via in the first set traverses at least two layers and has one contact on each of the layers, wherein one of the contacts is in shape of a quadrilateral polygon and one of the contacts is in shape of a non-quadrilateral (circular or oval) polygon (col. 86, ll.49-58).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen B Rossoshek whose telephone number is 703-305-3827. The examiner can normally be reached on 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on 703-308-1323. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

HR *HR*
May 27, 2003

[Signature]
D. M. Thompson
Patent Examiner
Technology Center 2802